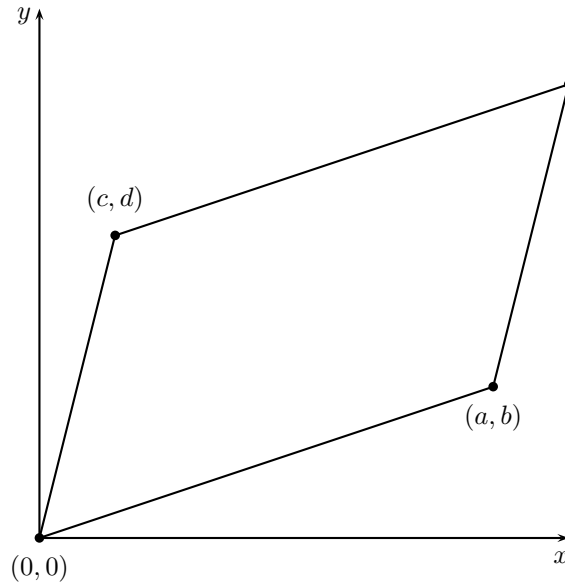


Parallelograms and Vectors

Let a , b , c , and d be nonnegative real numbers. Consider the following parallelogram:



1. Determine the coordinates of the vertex of the parallelogram whose coordinates are not given.
2. Determine the area of the parallelogram in terms of a , b , c , and d . (Hint: Think outside the parallelogram.)
3. Let $a, b, c, d \in \mathbb{R}$. (Note that a , b , c , and d can be negative now.) Given a parallelogram such that the vectors $\langle a, b \rangle$ and $\langle c, d \rangle$ emanate from a vertex of the parallelogram and form adjacent sides of the parallelogram, determine an expression for the area of the parallelogram.